EXHIBIT D

UNITED STATES DISTRICT COURT

NORTHERN DIVISION OF CALIFORNIA

SAN FRANCISCO DIVISION

IN RE PACIFIC FERTILITY CENTER LITIGATION,) Case No. 3:18-cv-01586-JSC

DEPOSITION OF ANAND KASBEKAR, Ph.D., VOLUME 2, taken on behalf of Defendant, via Zoom video conference, beginning at 9:03 a.m., Wednesday, November 25, 2020, before WENDY L. GRAVES, RPR, Certified Shorthand Reporter No. 6138.

A P P E A R A N C E S

(ALL PARTIES APPEARING VIA ZOOM VIDEO CONFERENCE)

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ZOOM VIDEO CONFERENCE

November 25, 2020

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Pursuant to Notice of Deposition and on Wednesday, November 25, 2020, commencing at the hour of 9:03 a.m. via Zoom video conference, before me, WENDY L. GRAVES, a Certified Shorthand Reporter and Deposition Officer of the State of California, there personally appeared

ANAND KASBEKAR, Ph.D.,

called as a witness by the Defendants, who, having been first duly sworn by me to tell the truth, the whole truth, and nothing but the truth, was examined and testified as follows:

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(DEFENDANT'S EXHIBIT 221 MARKED FOR IDENTIFICATION.)

THE VIDEOGRAPHER: Good morning, Counsel. My name is Philip Knowles. I am the host and videographer associated with Barkley Court Reporters located at 201 California Street, Suite 375, in San Francisco, California 94111.

The date today is Wednesday, November 25th, 2020, and the time is approximately 9:03 a.m. Pacific standard time.

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This deposition is taking place remotely via zoom in the matter of Pacific Fertility Center litigation, with Case No. 3:18-CV-01586-JSC.

This is the videotaped deposition of Dr. Anand D. Kasbekar, Ph.D., being taken on behalf of counsel for Chart defendants.

Will counsels for the parties please voice identify themselves now?

MS. ZEMAN: This is Amy Zeman on behalf plaintiffs.

MR. DUFFY: John Duffy on behalf of Chart.

MR. RINGEL: Kevin Ringel also for Chart.

THE VIDEOGRAPHER: Thank you, Counsel.

The court reporter may now swear in the witness and make a statement for the record.

ANAND D. KASBEKAR, Ph.D.,

being first duly sworn, was examined and testified as is hereinafter set forth.

EXAMINATION BY MR. DUFFY (resumed)

MR. DUFFY: Q. Good morning. Dr. Kasbekar, my name is John Duffy and I represent Chart in this case, and I will be taking your deposition this morning. I understand you have given quite a few depositions, so I will dispense with the ground rules.

The only thing I would ask you to do today is

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just try to wait for me to finish my question before you give your answer, because it makes it easier for Wendy, our court reporter, to take down the testimony. Okay?

A. I understand. I will do my best. And Wendy, please let me know if I am not doing well enough.

Q. Thank you. I wanted to ask you a little bit about your background. I know you have been deposed once before so I won't plow the same ground. My understand is for a period of time you were a professor at Duke University; is that right?

A. I had an adjunct professorship there that started back in 1995.

Q. And are you still an adjunct professor at Duke?

A. It's the same answer I think I may have given previously. I don't know when -- I had a multi-year appointment letter. I suspect it may have run out a year or two ago. I can check. But pretty much between about '95 and, you know, late 2010, '15, I was active there.

Then starting in about 2016 I began to slow down my business and relocate to Colorado. And for all practical purposes, even if the appointment is still theoretically valid on paper I have not been giving lectures or anything since 2016.

Q. Okay. So let me just break that down. You have

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not been serving as an adjunct professor at Duke's Engineering School since about 2016. Does that sound right?

A. That's correct.

Q. And then would you describe what the roles of an adjunct professor at Duke's Engineering School would be for the time that you were serving in that capacity?

A. Sure. My particular role, I think I break it down in to three things. Early on back in the early to mid, late nineties, I would be an advisor to students doing independent studies related to failure analysis and prevention.

I took on three students who did that, all senior level students. In fact, I think one of them went to work for Exponent for a brief period of time.

My regular duty was essentially providing lectures to the -- it was the ME 115 class, and now it's a 400 level class, but it's called failure analysis and prevention.

And then I would occasionally give lectures. They brought in some time after 2000 they started doing kind of an introductory course for all engineers that tried to touch on all the different facets of mechanical, electrical, civil, materials engineering, and I would generally lecture to the students with

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regard to materials and mechanical engineering and give them a taste of what the failure analysis and prevention forensic engineer career was like.

Q. Okay. So between the period of 2005 to about 2016, what percentage of your income came for serving in your role as an adjunct professor?

A. Close to none. The majority of my income during that time was either consulting or through the army research contracts which I had, and some industry contracts.

Q. Are you practicing full-time now as a forensic engineer?

A. I am not.

Q. You said you just moved to Colorado relatively recently?

A. That's correct.

Q. Are you in the process of potentially retiring?

A. I absolutely am.

Q. Okay. Congratulations.

A. Thank you.

Q. Have you had a chance to review your first deposition in the case?

A. I did review it since my -- since it was taken, yes.

Q. Is there anything that you want to change about

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your testimony from your first deposition?
A. I don't believe so. I mean, I know there are some typos and a few things in there. I think at times temperatures are referred to both by counsel and by me that should be negative that might be positive, but I don't believe there is anything major that I wish to change that I recall.
Q. Okay. So there is nothing major about your testimony in your first deposition that you want to change, correct?
A. Not that I recall. I do know that after reading Mr. Miller's report he did take some of my deposition testimony regarding really what was the amount of nitrogen that could possibly fit into the vacuum space I think a little bit out of context.
I started off that answer as this is a bit of a guesstimate at this point. We hadn't opened it up. But the intention of that answer was to basically say there is significant volume beneath the fill port in the vacuum space. But I don't know that I would need to change it. I just think it's being taken out of context, and that could probably -- more clearly.
(Simultaneous talking.)
Q. I guess my only question, is there anything that is important from your first deposition that you want to

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change today?
A. Not that I recall.
Q. Okay. I want to ask you a little bit about your practice today. Do you have your own laboratory?
A. I no longer do.
Q. When did you stop having your own laboratory?
A. 2016, thereabouts, give or take a year.
Q. Do you personally perform hands-on optical microscopy and scanning electron microscopy of fracture surfaces?
A. I did for 30 some years. I do not, as (indiscernible) -- yes, I do. I don't go into another person's lab and run their SEM. I have access to both labs at Duke, North Carolina State University.
I have a good working relationship with a lab in Sanford as well as a lab in Marieta, and I do use their optical microscopes there. I normally no longer -- I wouldn't walk into another lab and use their SEM, but I did for a number of years, 30 some years operate an SEM optical and metallurgical mounting polishing equipment.
In fact, the first seven years of my grad school career I was a lab assistant, teaching assistant for the course in failure analysis and prevention and also for the interim (ph.) materials course.
And the primary job for the failure analysis

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course that I was a teaching assistant for was to operate the SEM for every student who went through that class to help them evaluate their semester project, which they each had to come up with a failure, and part of that process would be to take their failed part and examine it in the scanning electron microscope.
Q. For your work in this case, did you personally do the optical microscopy?
A. I did do some optical microscopy while at Exponent, but all the samples have been in Exponent's possession. But while I was there there was a stereo zoom microphone adjacent to the Keyence microscope, and I did operate that and examine the fracture surfaces there.
Q. So you used Exponent's equipment to do that, correct?
A. That's correct. Excuse me. I should also say that I did bring the digital hand-held microscope, which was mine, and inspected the parts with that, also.
Q. Did you perform the scanning and electron microscopy yourself for your work in this case?
A. No. Again, all the parts that were examined with the SEM in this case were done jointly with a technician from Exponent operating the SEM.
Q. How many fractured components do you personally

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analyze each year?
A. Gosh, I would say it varies, but I probably would say anywhere from as little as 30 to as many as 50 projects a year for 35 years plus, as I said, for seven years while I was in graduate school and also working for research engineers. My role as a teaching assistant was basically to run the SEM.
Q. Since 2016, how many fractured components had you personally analyzed hands-on each year?
A. Since 2016, I would probably say maybe on the order six to 10 per year. I really started winding down and retiring in 2016.
Q. Let's say from 2018, could you tell me how many fractured components you personally analyzed each -- during the year of 2018?
A. I can tell you in 2018 I think one of the bigger projects I was involved in was a fatigue failure of a weld pressure vessel, and it was about -- it's a large vessel. That was one of the major cases I had, and we spent days analyzing that, both optically and with SEM.
Beyond that, I have had this case, and I can tell you right now I probably have three or four active cases left, and I'm not taking new cases.
Q. Okay. So in 2018 then you had the pressure vessel fractured component work and also the work in

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this case; is that correct?
A. That's correct. I may have had a fractured component on a bicycle that I was looking at, and then I have one other active case that's been going on. It's a defense case that relates to a number of the same product, but that's basically a 6061 aluminum tool that's been fracturing.
Q. Okay. So if I understand then in 2018 you had three projects that you were personally doing hands-on analysis of fractured components, that would be the Pacific Fertility litigation; is that right?
A. That's correct.
Q. And then the pressure vessel case?
A. Correct.
Q. A bicycle case?
A. Correct.
Q. And then another case in which you are working with defense?
A. Yeah. I kind of hesitate to name the product, but let's just call it the aluminum rod fatigue failure.
Q. Okay. So just in 2018 you had four active projects, correct?
A. That's correct. Yeah, and my goal is to get down to zero. So I'm looking forward to that.
Q. And in 2019, how many active cases did you have

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where you were personally analyzing fractured components?
A. I would say in 2019 I really have -- I mean, I have got, I think -- I have got this and really two or three other cases. In 2019, I worked on this case. I'm trying to think if there is anything else where I was actually in the lab in 2019. I don't recall any right now.
Q. Okay. So the work that you did in a lab looking at fractured components in 2019 would just consist of your work in this case. Is that fair?
A. I think that's probably fair. I mean, I may have -- so I have, as I said, a good relationship with a laboratory in Sanford, North Carolina. I probably may have been in that lab helping with some things looking at components under the microscope on this bicycle case, and actually that would have been relatively recently.
Q. So how about 2020, just to round it off. I know it's a very unusual year, but how many fractured components you've evaluated in 2020?
A. 2020, I think the only fractured component would have been this.
Q. Okay. When you perform a failure analysis on a fractured component, isn't it proper procedure to perform a macro scale and micro scale analysis?

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A. Absolutely.
Q. Isn't one of the first steps to identify if the fracture is ductile or brittle on the macro scale?
A. Yes, it is.
Q. If the fracture is accompanied by gross plastic deformation, doesn't that make it a ductile fracture?
A. Not necessarily.
Q. Why is that?
A. Well, it depends on what part of the fracture surface you are talking about. First of all, let me tell you that I do agree that in general this is a ductile fracture, in the case that we're here to talk about today.
But you can -- in looking in this particular instance, you can have something that starts off in more brittle fashion and then ends up finishing in a ductile fracture.
Q. Is that what you think happened here?
A. I don't know that this is necessarily a brittle fracture. I just think that this is a progressive fracture that occurred over a number of cycles.
Q. What are the possible failure mechanisms for a macro scale ductile fracture?
A. You are going to have to define what you mean by "failure mechanisms."

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Q. Well, is one failure mechanism for a macro scale ductile fracture a monotonic ductile overload?
A. Sure. So you can have monotonic ductile overload. You can have -- let me ask you to repeat your question. Was ductile in your question?
Q. It was, yes.
A. So possibilities for -- definitely you can have a sheer fracture. You can have ductile tearing in a fatigue fracture.
Q. Could you have very low cycle fatigue, as well?
A. You could. Absolutely.
Q. All right. I have gone ahead and premarked the two reports, the one from Mr. Parrington and yours. I am going to ask you a few questions about that, if I can, so you can help me understand something.
A. Absolutely.
Q. If you would open on the chat feature, Dr. Kasbekar, it would be your report, which we have marked as Chart Defendant 221. Let me know when you have had a chance to open that document.
A. You guys are going to have to help me with the chat feature.
THE VIDEOGRAPHER: John, he may not have been signed in when you sent it, so you may have to resend it.

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MS. ZEMAN: Is the version in the chat stamped?
THE VIDEOGRAPHER: Mine is.
MR. DUFFY: Can you share it in the chat then, Philip?
THE VIDEOGRAPHER: Yes, give me a minute, because I will have to save it and then send it back. Bear with me, yes.
MR. DUFFY: It's actually in the Parrington report. I'm sorry.
THE WITNESS: I think I'm seeing it. It wants me to download it. Is that kind of the next step?
MR. DUFFY: That's right.
THE WITNESS: Okay. Bear with me one sec.
MS. ZEMAN: John, do you want him to look at the Parrington report now?
MR. DUFFY: Yeah, the Parrington report. I'm sorry. I misspoke.
THE VIDEOGRAPHER: Sorry for all this unnecessary commentary, Wendy.
John, I have now saved that. Do you want me to load it in to the chat room?
MR. DUFFY: Sure, that would be great.
Q. Dr. Kasbekar, let us know (inaudible).
A. Yeah, I'm trying to get it to open. I have a copy of it. I don't know if I have your copy is the

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only issue.
Q. Okay. Maybe let's have it on the same --
A. There we go. I have got it with the exhibit sticker on it. Okay.
Q. Perfect. Could you please turn to page 25 of the Parrington report at Figure 28?
A. Okay.
Q. Just to help me lay a little foundation here, Dr. Kasbekar. Did you have an opportunity to read Mr. Parrington's report before today?
A. I did.

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[redacted]

Q. At the Zoom inspection of the exemplar tank and welds that you were using, you showed seven weld mock-ups labeled 1 through 7; is that right?
A. That's correct.
Q. They were the single and double sided welds, as well as the fittings with and without the chamfers?
A. That's correct.
Q. Who performed the welding?
A. That was done by an individual by the last name of, um, I think it's Reans, first name Thomas.
Q. How do you spell Mr. Reans' last name?
A. I believe it's R-E-A-N-S, but I am not sure about that. I can check that and get back to you.
Q. And who is Mr. Reans?

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A. He was a welder that works for a local machine shop that I have been working with for years that had experience welding stainless steel.
Q. And where is Mr. Reans located?
A. In North Carolina.
Q. Where in North Carolina?
A. I don't know his home address, or his business address.
Q. What's the shop that you -- the shop that you have been working with where Mr. Reans is?
A. Chesson Machine is where I met with Mr. Reans to do the welding.
Q. How do you spell Chesson?
A. C-H-E-S-S-O-N.
Q. What town is that located in?
A. That's in Raleigh, I believe.
Q. And what does Chesson do, what type of business?
A. Chesson is a machine shop that's been around for quite some time. I have had other projects where they have built test fixtures for me, helped me with sectioning components that needed precision cutting, building different devices for me over the years.
Q. What are Mr. Reans' qualifications as a welder, do you know?
A. I know some general background that he provided to me. I think he was in the navy for some period of time. He did some work I think in nuclear plants, if my memory is correct. And does work for the pharmaceutical industry as a freelance welder, and I think for a number of other industries.
He's an individual that I only met briefly for the purpose of assisting me with these welds.
Q. When did you first meet Mr. Reans?
A. It was on the date that I did the welding. I'd have to go look back at my photographs to give you the exact date.
But that was the first time I met him. He showed up, I showed up with the components, and went to work.
Q. Was that in 2020 was the first time --
A. Yes, yes, 2020.
Q. Did you investigate whether he was certified in any way as a welder?
A. I did not.
Q. Are you aware that welders often can be certified?
A. Yes. And I suspect that he was, given his background. But I did not ask for his certifications.
Q. How would you think he was certified?
A. Again, I didn't get into that with him, so I'd be speculating. I just know from prior working careers I have had if he, in fact, was doing work in nuclear plants then he would have been certified.
Q. Okay.
THE VIDEOGRAPHER: Can I have a sec? I'm hearing an echo. Is anyone else hearing that?
(Discussion off the record.)
THE VIDEOGRAPHER: We are going off the record at 9:31 a.m., Pacific standard time.
(Discussion off the record.)
THE VIDEOGRAPHER: We are now going back on the record. The time is 9:34 a.m. Pacific standard time.
MR. DUFFY: Wendy, would you read back my last question just so I can orient where I was?
(Record read by the reporter.)
MR. DUFFY: Q. Okay. Would you agree that welders can be experienced enough through their training at their employer to be reasonably capable welders?
A. I think that's certainly a possibility.
Q. And Mr. Reans was in the navy; is that right?
A. Again, I talked very briefly with him when I met him. Because, quite frankly, I was very impressed. I have seen a lot of welding. I have welded myself. What he did on his first attempt at this, I was very impressed. So I asked him a little bit more about his

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work and his background. He came highly recommended from an individual I have a great deal of respect for.

He was probably 10, 15 years our senior, and he explained to me that he had been in the navy for some period of time and gave me just a general rundown of his welding experience, and he came very prepared to tackle what we had asked him to do.

Q. Did he weld in the navy?

A. That's my understanding, yes. That was his explanation to me.

Q. And then at some later point he worked for a nuclear power plant as a welder?

A. I think that's correct, and then more recently I know that he does work for the pharmaceutical area in North Carolina. There is a lot of pharmaceutical plants. There is also a lot of microbreweries that have popped up, and I think he does work in those areas.

And, as I said, he came highly recommended. He was the individual that the machine shop goes to when they need, I think, more precision welding of especially stainless and aluminum materials than they are comfortable doing.

Q. In the navy, do they weld stainless steel?

A. I would assume that they do, but -- I know, in fact, that's part of my -- I had a job for a consulting

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firm in DC where we basically did failure analysis for power plants and for the navy. They do, in fact, weld stainless steel in the navy.

Q. Were there any problems with melt-through for the weld made from the second weld that comes from the vacuum space side?

A. I don't have the numbers of each weld memorized in my head, but I will say that, yes, doing a -- when you said the second weld, you don't mean the second sample but the pass on the back side, the vacuum space side?

Q. On the vacuum space side, correct.

A. Yes. It's definitely difficult to do that on that thin material, and there are some spots where you do get some burn-through. One sample there was -- actually, the first sample there was significantly less

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[redacted]

[redacted]

[redacted]

[redacted]

11 Q. When you wrote your first report in this case,
12 did you have an exemplar freezer available to you?
13 **A. I did not.**
14 **Q. You were provided with an exemplar freezer in**
15 **approximately October of 2020; correct?**
16 **A. That's correct.**
17 **Q. Then based upon your analysis of the exemplar**
18 **freezer you added some additional opinions to your**
19 **second report in this case; is that fair?**
20 **A. That's correct.**
21 **Q. At the time that you wrote your first report,**
22 **did you have access -- strike that.**
23 **At the time that you wrote your first report,**
24 **did you have a lab associated with your work for which**
25 **you could conduct this testing that we're talking about?**

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MS. ZEMAN: Objection. I think this goes into discovery that's blocked by the expert discovery stipulation we have in place.

MR. DUFFY: Help me understand, Amy.

MS. ZEMAN: I don't think that that discovery stipulation allows you to delve into work done, other than what was relied upon for the report. Perhaps rephrasing your question might solve the problem.

MR. DUFFY: Q. When was the last time you maintained a lab associated with your forensic engineering practice?

A. My own lab?

Q. Correct.

A. I pretty much moved out of my lab and offices, I don't remember the exact month, it occurred over several months, but in 2016. I actively started retiring and pretty much stopped taking cases in 2016.

Q. Can you explain to me why you didn't test your theory that the crack in the weld caused the loss of the vacuum seal?

A. Well, I feel like I have tested my theory for the reasons I just explained to you. But --

(Simultaneous talking.)

MS. ZEMAN: I would like to put an objection, misstates testimony, in there.

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THE WITNESS: What I will say is that I looked at the possible failure modes that would explain the nature of the fracture that we have and the damage that we have.

And that's based upon days and weeks of testing conducted by joint testing by multiple parties. And based upon that testing, what became clear to me is that we had a fatigue crack. And in a structure like this, a small opening will result in loss of vacuum.

We have a system that is subjected to cyclic loading, and we have no other potential leak sites or reasonable explanations for nitrogen getting into the vacuum space.

So like as in many failure analyses, some things are done through process of elimination.

MR. DUFFY: Q. But that's analysis by an expert, correct?

A. It's analysis based on testing by an expert, yes, which is the way the majority of failure analyses are conducted.

Q. And you can come to a conclusion about a potential failure based upon testing of components, correct?

A. Yes, sometimes you can. I mean, if you want to give me a specific hypothetical, I will answer it.

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Q. There is a crack in a weld in a cryogenic freezer and someone comes to the conclusion that that's what caused the vacuum seal loss.

A. So what I would do is try to see if there is any other evidence of vacuum seal loss anywhere else on the tank, if there are any other leak sites. And that is the testing that I did.

And in the absence of any other leak sites and a crack that, in my opinion, took place over some period of time, it is, I think, a very reasonable, logical scientifically sound conclusion that that crack is most probably the breach that led to loss of vacuum.

Q. Let's say you have an exemplar MVE 808, and you through your analysis recreate the crack in the weld at issue, and you filled up the freezer with 14 inches of liquid nitrogen. What would you expect that test to show?

MS. ZEMAN: Objection. Incomplete hypothetical.

THE WITNESS: I would expect it to show an increase evaporation rate of the nitrogen. I would expect it to eventually show, because of a loss of vacuum, condensation and frost build-up on the exterior of the tank.

And then I would expect over some period of time that if sufficient nitrogen were to enter into the

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vacuum space and you were to allow the remaining nitrogen in the tank to evaporate off that you would have a buckling of the tank.

MR. DUFFY: Q. Do you have any plans to run that type of an experiment on the exemplar that you currently have access to?

A. I do not.

Q. Would doing that kind of testing on an exemplar be a good practice for a forensic engineer?

A. Well, we're kind of going around in a circle a little bit, Mr. Duffy. I think the issue with what you are getting back is reproducing that exact crack would be -- it would be difficult for me to prove to you or your experts that whatever crack I put in there was the same crack as the crack that occurred in service in this clinic.

And for multiple reasons. One, recreating the loading, the environment, the usage of the tank. But the hardest part to do would be to recreate that weld. I mean, your own expert indicates that we have a solidification crack right in the area where I believe the crack originated.

I don't think anyone could recreate that same solidification crack. But yet we've got the same degree of penetration.

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I mean, that would be -- you are tasking me with doing things that are unreasonable to do. I mean, sure, given 20 years and an infinite budget, CT scanning hundreds of welds, maybe we could do that. But I don't think there is any need to do that in this case. To me the evidence clearly explains the nature of the crank and the eventual implosion of the tank.

[redacted] I basically looked at the evidence. I formed a theory. I conducted testing. I looked at the usage of the piece of equipment.

Unlike Mr. Parrington, I looked at the loads that the area in question would have been subjected to. In my mind, and this is where I differ with him -- in many ways I don't differ with him, but this way I do. There is cyclic loading, and thermal stresses in cryogenic vessels is not something that's unheard of.

Q. Can you think of any peer-reviewed publications that would support your methodology for coming to the conclusion that the crack in the weld caused the loss of vacuum seal in the dewar?

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A. Yes. I mean, I believe that the methodology for failure analysis that ASM has in their handbooks and the procedures that I followed are fairly parallel.

Q. Can you tell me what the error rate or potential error rate of the methodology that you used to reach this conclusion would be?

A. Well, I can tell you that I think the error rate for the methodology in this particular case is going to be low. I can't give you a numerical value, because we'd have to analyze this failure over and over again with known causes to see how many times we get it right and how many times we get it wrong.

But I feel like, I mean, the scientific method that I went through to arrive at my conclusions is the methodology that engineers and failure analysis around the world use on a routine basis.

Q. So it's fair you don't know the error of the potential --

A. I can't give you a numerical error rate. I'm very confident in my findings.

Q. Is the technique that you use to reach the conclusion that the crack in the weld was the cause of the vacuum seal loss, is that generally accepted in the scientific community?

A. Yes, it is, in my opinion, and if you read

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through the case studies in Volume 11 of the ASM handbook or other failure analysis case studies, it's that same methodology. We do background research to learn about the device in question, how it was used, service conditions.

We look at the nature of the mechanism or the structure. We do fractography of the failed component, if there is, in fact, a fracture. We look at the types of loading that the component would be subjected to.

We look at other possibilities to explain the damage, in this case, the incursion of nitrogen into the vacuum space. We rule out, just like your expert did or attempted to do -- I don't agree with his findings -- but to rule out other possibilities. And then we come to a conclusion. I have been doing it for three and a half decades or more.

Q. In reviewing your two reports and your deposition, is it fair to say you came to the conclusion that the LN2 in tank 4 evaporated between 7:00 a.m. and 12:30 p.m. on March 4, 2018?

A. After the lid was removed is what we're talking about?

Q. Let me ask that question again.

A. Okay.

Q. After reviewing your deposition and both of your

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reports, have you come to the conclusion that the LN2 in tank 4 evaporated between 7:00 a.m. on March 4, and 12:30 p.m., when Dr. Conaghan opened the lid?

A. I'm not sure I completely understand the question, because when you say evaporated between 7:00 a.m. and 12 -- I mean, what do you mean by evaporated?

There is testimony that indicates that there was some level of nitrogen in the tank when Dr. Conaghan and the other embryologist were able to get the lid off the tank.

Q. Right. So let me back up and lay a little foundation. Hopefully, we can all be on the same page.

A. Sure.

Q. So the measurement that was taken on March 3rd by Jean Popwell was 14 inches. Do you recall that?

A. I do.

Q. And then on Sunday, March 4, at approximately 12:30 p.m., Dr. Conaghan, with the help of Miss Popwell, was able to take off the lid, and he testified that he took a dip stick, put it inside tank 4, pulled it out, waved it around and got a one-inch frost line. Do you recall that testimony?

A. I do recall. I think he may have said at most one inch, but yes, I recall that testimony.

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Q. All right. So based upon that testimony, is it your opinion that the LN2 in tank 4 evaporated between 7:00 a.m. on March 4 and 12:30 p.m. on March 4, when Dr. Conaghan was able to open the lid?
A. I'm going to go back to, when you say evaporate, what's -- I'm certain that there was some evaporation that went on between 7:00 a.m. and 12:00.
Q. Okay. How much --
A. Am I prepared to quantify that? No, I am not. I don't have an opinion to quantify exactly how many nitrogen may have evaporated during that time period.
Q. What was the average daily evaporation rate for tank 4, do you recall?
A. I don't recall. If you had asked me this earlier, I would have, but I don't recall off the top of my head.
Q. Does about an inch to an inch and a half per day sound about right?
A. You know, I know in my report, I have to go back and look at that, that I have a number associated with what the normal net evaporation rate is. But for tank 4 at this point in time I don't have a -- I can't answer off the top of my head what the average evaporation rate is.
Q. Okay. If the evaporation rate was an inch to an

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inch and a half per day and Miss Popwell measures 14 inches on Saturday, the 3rd, you would expect about 12 and a half inches in that tank by mid-day on March 4, correct?
A. I would agree with something in that range, yes.
Q. And when Dr. Conaghan opens the lid and conducts a manual measurement he gets an inch, maybe less, correct?
A. Correct.
Q. So we see about 11 and a half inches of LN2 missing on March 4, correct?
A. That's correct.
Q. And is it your opinion that that evaporation of about 11 and a half inches occurred between 7:00 a.m. and 12:30 p.m. on March 4?
A. Well, my opinion is that elim -- assuming that the 14 inch number is accurate, my opinion is that nitrogen went somewhere. How much of it went to evaporate, how much of it could have entered into the vacuum space and perhaps be trapped between the insulation and the inner tank wall is something that I don't have a firm number on. But it went somewhere.
My opinion is that the crack is the cause of that nitrogen level changing so quickly in that relatively short period of time.

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Q. So that 11 and a half inches of LN2 goes through that crack, correct?
MS. ZEMAN: Objection. Misstates testimony.
THE WITNESS: Some of it can evaporate. Some of it may go through the crack, assuming that the 14 inches is accurate.
MR. DUFFY: Q. Do you doubt the 14 inch measurement that Jean Popwell took on Saturday, March 3?
A. I can tell you from what I have seen, I don't know that it would be off, but it could be off by an inch or so or something, it's possible, or half an inch. Again, my assumption is that it was reasonably accurate.
Q. So your assumption is the measurement taken on Saturday, March 3 by Jean Popwell was reasonably accurate. Is that fair?
A. That's correct. I have no reason to believe that it wasn't.
Q. So is my reading of your first and second report and your first deposition fair in that you came to the conclusion the loss of liquid nitrogen occurred between 7:00 a.m. on March 4 and 12:30 p.m. on March 4?
MS. ZEMAN: Objection. Misstates testimony.
THE WITNESS: No. I mean, we could have had a loss -- you are going to have some loss of liquid nitrogen. From the time you fill it, it's going to

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immediately -- it's evaporating at some rate. We've discussed that.
So it was last filled, I don't remember the exact time right now, but the evening or late in the day before the incident. And I believe it evaporated overnight.
At some point I think this crack got to the point where it made it through the entire wall, allowing a loss of vacuum, increasing the vacuum rate, and likely sucking nitrogen, some nitrogen into the tank.
Q. How long did that take?
A. I don't have a -- how long did it take? It happened sometime between when the tank was filled and the time the incident was discovered. It could have been happening over some period of time, too.
Q. You would agree with me it would have had to evaporate between the time it was filled by Ms. Popwell until it was measured by Dr. Conaghan, correct?
A. Again, I am just going to say when you say it would evaporate, you are talking about the change in level from near 14 inches to near one inch.
Q. True.
A. I agree that, assuming those two numbers are correct, that had to happen between the time it was last filled and the time that the one-inch measurement was

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taken.
Q. And then, to be clear then, you don't hold the opinion that the LN2 evaporated between the hours of 7:00 a.m. on March 4 and 12:30 p.m. on March 4?
MS. ZEMAN: Objection. Misstates testimony.
THE WITNESS: I'm not trying to be difficult, Mr. Duffy. It's just a hard question to answer, because as I told you, it's evaporating all the time.
MR. DUFFY: Q. I understand that.
A. I don't agree that it went from 14 inches to one inch between 7 a.m. and 12:00.
Q. Okay. And I understand that, because we have a natural evaporation rate. We agree upon that, right?
A. Correct.
Q. And if we back out the natural evaporation rate, it leaves us with about 11 and a half inches of liquid nitrogen, correct?
A. Something in that ballpark, yes.
Q. Do you believe that the 11 and a half inches of liquid nitrogen was lost between the hours of 7:00 a.m. on March 4 and 12:30 p.m. on March 4?
A. No, not necessarily. I mean, that could have started happening at a greater rate than the normal evaporation rate at any time after the tank was filled.
MS. ZEMAN: John, we've been going for about an

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hour. When we have and opportunity, could we have a five-minute break?
MR. DUFFY: Yeah, let's do it now, if that's good. Dr. Kasbekar, do you need to take a break now?
THE WITNESS: Yeah, that would be great.
MR. DUFFY: Okay. Thank you.
THE VIDEOGRAPHER: We are going off the record at 10:06 a.m.
(Recess taken.)
THE VIDEOGRAPHER: We are now going back on the record, and the time is 10:20 a.m. Pacific standard time.
MR. DUFFY: Q. Dr. Kasbekar, do you have an opinion as to how long it took for the liquid nitrogen to evaporate 11 and a half inches between March 3 and March 4?
A. I think that evaporate occurred between the time it was filled and the time that the one inch, approximately one inch or less measurement was made by Dr. Conaghan, that's my opinion.
Q. Did you have a chance to review the data download that came from the controller on tank 4?
A. I did a long time ago.
Q. Okay. If I told you that there is some evidence in the data download that someone was working on tank 4

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on March 3rd at approximately 2:30 p.m., and we then accept that Dr. Conaghan's estimate is he discovers the incident at 12:30 the next day, would you agree that's about a 22 hour period of time?
A. I would.
Q. And is it your opinion that in that 22 hour period of time 11 and a half inches of liquid nitrogen was lost?
A. Again, assuming that the reported measurements are reason reply accurate, yes. That's what it implies to me.
Q. Have you seen evidence that questions whether Miss Popwell actually measured on March 3rd?
A. I recall some discussion about that on reading something, but I am not intimately familiar with it.
Q. That would be an important fact to calculate the evaporation rate; would that be true?
A. As to whether or not that measurement was accurate?
Q. Correct.
A. Well, yes. I mean, that's the reason I have answered all your questions by saying assuming that it's accurate.
Q. If we were to assume that she didn't measure on Saturday, March 3rd, how would that impact your

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opinions?
A. I don't know that it would impact it significantly. I mean, my opinion is essentially related to the physical evidence that we've seen. I mean, that's a primary driving force is the testing, inspection and physical evidence, and understanding of the manner in which it works and the documents reviewed by Chart that we discussed earlier regarding failure mechanisms.
I'd also add to that, in addition to the emails that indicate nitrogen entering into the vacuum space from the inner tank being the cause of prior failures in Chart's documents, Chart's own failure modes and affects criticality analysis that the DFMECA specifically addresses exactly what we have happening here, which is a crack in the annular weld allowing nitrogen into the vacuum space and an implosion of the tank.
Q. But just to be clear, though, if Miss Popwell did not measure liquid nitrogen at all on March 3rd, it would not impact your opinions, correct?
A. Not with regard to the failure mode, and --
Q. But what would --
A. Well, quite frankly, I don't know that I have very many opinions regarding evaporation rate and specific rates of flow of nitrogen into the vacuum

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space.
My opinion really is that there was a progressive failure of the weld in question that led to a breach between the inner tank and the vacuum space that allowed nitrogen to get into the vacuum space.
Q. But you don't have any opinions on at what rate the liquid nitrogen evaporated, correct?
A. Nothing beyond what we've really discussed and what's documented in the testimony.
Q. Could you have tested your theory that the liquid nitrogen evaporated between 2:30 on March 3rd and 12:30 on March 4?
A. Number one, I have no reason to do that and no real need to do that. And it's based upon assumptions of measurements taken by two people. That would be the error in any testing that was done.
But the assumption I relied upon is that there was a reasonable supply of nitrogen in the tank the day before.
Q. I guess my --
A. But honestly, the evaporation rates are not critical to my role in this case, which is to determine the cause of the failure.
Q. I guess my question was a little different, Dr. Kasbekar. Let me try again. Could you have tested

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the LN2 evaporation rate between March 3 and March 4 to support your opinions?
A. For that particular tank, no. For a new exemplar tank, I guess that would be feasible to do. But this is a six year old tank that nobody knows what exactly the vacuum level was at that time. The condition of the lid would have to be replicated. So no, I could not do it for that tank.
Q. It's not possible?
A. Not for that specific -- for tank number 4, no.
Q. But an exemplar you could have done that for, correct?
A. An exemplar that could be done for, and I think that data already exists in Chart's own literature.
Q. Well, I guess I'm not talking about the known literature. I'm talking about testing your conclusion that the LN2 evaporated between 2:30 on Saturday, March 3rd and Sunday, March 4 at about 12:30.
MS. ZEMAN: Objection. Misstates testimony.
THE WITNESS: Mr. Duffy, I'm not sure that that is what I have testified to. I do agree that there was evaporation that occurred between that time, and we've talked about it extensively. It depends on the measurements that were made.
But if, in fact, it was filled to 14 inches and

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if, in fact, it was one inch or less, that nitrogen went somewhere. How much of it went to being evaporated, how much of it could have been introduced into the vacuum space I don't have an opinion on.
MR. DUFFY: Q. Couldn't the testing of the evaporation rate help you determine whether the measurement that was done by Miss Popwell on March 3 was accurate?
A. I'm going to answer the same way I did before. We don't have a way of quantifying on the day before, when this tank was filled, what the vacuum level was in tank number 4, and that's going to have an effect on the evaporation rate. That's something that I don't know a way to reproduce, because there is no way to measure that vacuum level.
And then we're dealing with a tank that's several years old.
Q. Um.
A. So doing it with a new tank, in my opinion, would not be a reliable way of reproducing what may have happened with the subject tank.
[redacted]

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[redacted]

[redacted]

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Q. In the two that you have actually examined, you found what you perceived to be an issue with both, which is the sharp weld artifact at the weld root, correct?
A. In differing degrees.
MS. ZEMAN: Wendy, did you get my objection to that prior question?
THE REPORTER: No, I didn't.
MS. ZEMAN: I have an asked and answered

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objection.
THE REPORTER: Thank you.
MR. DUFFY: Q. In your report, I saw that you had come to the conclusion that an MVE should have a 10 year life cycle; is that right?
A. I don't know that I came to that conclusion. I know Chart has documents, and I believe I have referenced in my report, that suggested that that was a reasonable life span.
Q. But do you hold the opinion that the MVE has a 10 year life cycle?
A. The term "life cycle" is something I have not seen. I'd have to go back to the document. It's been awhile since I reviewed it, but I think that was the intended design life. Does that sound correct to you? I don't remember the word "life cycle." If I'm wrong, I apologize.
Q. Sure. No, I will use the word design life. Have you come to the opinion that the MVE has a 10 year design life?
A. Again, that's my understanding of what Chart has indicated in documents provided to me.
Q. But do you hold that opinion, or are you just relying on documents that you --
A. Well, I certainly think that would be a

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reasonable life span. I mean, you have a structure that's made out of three or four stainless steel, and certainly could be built robustly enough that you shouldn't have a failure like what we have here in that period of time. I think it's certainly feasible to design something to last at least that long.
Q. Well, I understand that. But do you have an opinion that the MVE 808 has a design life of ten years?
A. Based on the documents, my opinion is that seems to have been the intended span.
Q. Have you ever observed a cryogenic dewar like tank 4 lose its vacuum seal?
A. I mean, I have never observed the process of that happening, but I am aware that that does happen, and I understand why.
Q. But you have never seen it yourself, correct?
A. I mean, I haven't seen it actually in the process, but I have seen cryogenic vessels, not necessarily NVE808s, but other tanks that have lost their vacuum seal.
Q. I guess my question is just a little bit different, Dr. Kasbekar.
(Beginning of question cut out.)
THE REPORTER: I missed the first part of your question.

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MR. DUFFY: I'm sorry. No problem.
Q. Dr. Kasbekar, my question is a little different. Have you personally ever witnessed a cryogenic dewar-like tank 4 lose vacuum seal in front of you?
A. Actually, yes, I have.
Q. Where did that happen?
A. It happened at ATS on the exemplar when I drilled a hole into the side of the tank in order to basically deconstruct the tank.
Q. When did you do that?
A. In October of this year.
Q. And when you drilled a hole in the side of the tank, did you do so -- well, strike that.
Did you use a drill bit to do that?
A. I did.
Q. What was the diameter of the drill bit?
A. Oh, I am going to say it was on the order of 3/16ths of an inch plus or minus a 16th. It may have been a quarter inch drill. I just don't remember. I can determine that, but I don't remember.
Q. At what height inside the dewar did you drill the hole?
A. It's documented in my photos, but it was drilled in the outside, and it was close -- it was just below, I believe, the upper circumference or upper seam weld.

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Q. Upper what weld? I'm sorry. I didn't hear you.
A. Seam weld. I'm sorry. Not seam weld. It's the circumferential weld that joins the outer tank walls to the outer tank head.
Q. And when you did that drilling did you spoil the vacuum in the dewar?
A. I did.
Q. How much liquid nitrogen did you have in the dewar of the exemplar at that time?
A. I didn't have any, and it wouldn't have mattered because I was drilling into the outside of the tank.
Q. Okay. But I guess my question was, what I was asking, have you ever seen a cryogenic dewar lose its vacuum seal in front of you, you said yes, and it was only by virtue of this drill, correct?
A. That's correct. I interpreted your question have I actually seen one just degrade right in front of me. And then when you repeatedly asked I realized that I actually had intentionally induced the leak.
Q. Okay. So the way you did it was by drilling a hole through the exterior of the dewar; is that right?
A. That's correct.
Q. And you had no liquid nitrogen in it when you did that, correct?
A. Right.

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Q. Did you ever fill it with liquid nitrogen so you could test the evaporation of the LN2?
A. Did not.
Q. Why didn't you do that?
A. Because I was interested in the condition of the weld as it left the factory without putting any other service conditions on the tank prior to looking at the weld.
Q. Are you aware of any testing that's been done in published papers on drills into cryogenic dewars when they have liquid nitrogen in them?
A. Early on in the case I may have read some papers where they were looking at vacuum loss, but I'm not sure that it -- again, the reason I drilled the hole in the outside of this tank was not to study vacuum loss or anything else. It was to allow a hole saw to be used to allow access to cut the top of the tank off.
Q. Before you did that, though, could you have filled it with liquid nitrogen just to test the evaporation rate before you cut the top of?
A. I could have if wanted to, but that would have caused additional stresses in the area of the weld, and I wanted to look at the weld prior to doing that. I would have had to buy two tanks to avoid that situation.
Q. Did you research any literature in conjunction with your opinions?
A. I did.
Q. What type of research did you conduct?
MS. ZEMAN: Objection. Again, this goes beyond the scope of the expert discovery. His report indicates what materials he's relied on.
MR. DUFFY: Q. And the materials that you have relied on for your opinions are in your report, correct?
A. That's correct, and I also have done general reading at the beginning of this case related to cryogenic vessels such as this, and learned a little bit more about the fertility clinic industry just as part of the background process that I think is important to conducting this type of investigation.
Q. So aside from the incident where you drilled the hole on the exemplar from the outside, have you personally ever witnessed a cryogenic dewar like tank 4 lose vacuum seal with liquid nitrogen inside?
MS. ZEMAN: Objection. Misstates testimony.
THE WITNESS: I am going to answer it this way. As a graduate student, I have seen cryogenic storage vessels that have lost vacuum with nitrogen inside. But whether that happened over minutes or hours, I don't know. I have just seen the net effect of that happening, and we've had to replace those vessels and

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get new vessels in.
MR. DUFFY: Q. Would this would have been when you were with Duke University?
A. That's correct.
Q. And there was a cryogenic dewar there?
A. Well, we had cryogenic dewars. We also had liquid nitrogen tanks in our laboratories there.
Q. How many cryogenic dewars did they have at Duke when you were there?
A. Well, at all of Duke University I don't know, probably thousands. I have no idea.
(Simultaneous talking.)
THE WITNESS: In our immediate lab, we probably had, I don't know, a half a dozen dewars.
MR. DUFFY: Q. And were they cryogenic dewars?
A. When you say a cryogenic dewar, I mean, how does that differ from a dewar? They were liquid nitrogen dewars.
Q. Okay. So the half a dozen or so dewars at Duke in the lab that you are familiar with were able to hold liquid nitrogen?
A. That's correct.
Q. And --
A. That's what they were used for.
Q. And what was your experience in working with

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those dewars?
A. Um, I'm not sure how to answer the question. What do you mean what was my experience? Over the course of really both as a -- you know, undergrad and graduate student I had the opportunity to use dewars in the line of work that we were doing. You are asking me what I did with them?
Q. Yes.
A. Oh. So the routine thing that I did is we had a -- God, I'm trying to remember the brand. We had an EDAX unit on our SEM that required liquid nitrogen to be maintained in it, and one of my responsibilities for my time period starting really as a senior undergrad and lasting another seven or eight years was to maintain that.
That involved taking a, I think at times of what I will call a medium size dewar, filling it from a supply tank located at a different part of the building. Taking it, and then a medium size dewar, I'd empty a portion of the nitrogen into a smaller dewar, which would then go into the SEM EDAX unit.
I also utilized dewars in my research, because I have a temperature control chamber that I built, and it was controlled by -- the cooling was controlled with nitrogen as well as a temperature bath, depending on

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what temperatures we were trying to get to. That's the majority of my experience.
Q. Did the cryogenic dewars in the lab that you were familiar with at Duke, did they have computer controllers on them?
A. No, they did not.
Q. In what years were you at Duke working with these cryogenic dewars?
A. I would say probably between about 1984 all the way through to 1994. Probably less in 1993 and '94.
Q. One of those dewars lost its vacuum seal?
A. One of the supply tanks I know lost its vacuum seal, and we had to replace some of the medium size dewars because they were not able to maintain insulation. So I assume that it was due to the vacuum seal loss.
Q. Let me break that down. There was a supply tank when you were at Duke that lost vacuum seal, correct?
A. Correct.
Q. And then there was one or two dewars that had to be replaced because they weren't holding temperature?
A. I know that we had a supply tank that we took down to service at one point. And then we had a larger dewar, not as large as the 808, but it was a portable dewar that we used to supply. It was kind of an

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intermediary between the big supply tank and the small vessel dewar that we used to fill the EDAX unit.
Q. And that --
A. The medium size tank at one point went bad. The reason we knew it went bad is we would come back and there would be almost no nitrogen in there after filling it, and there would be frost all over the outside of the tank.
Q. Okay. That's one of the things I just wanted to make sure I could ask you about what you observed. So when you were at Duke there was a supply tank that lost vacuum seal, correct?
A. Right.
Q. When it lost vacuum seal it exhibited signs and symptoms of that on the exterior of the supply tank; is that fair?
A. It did, yes.
Q. Would you describe for us, please, what signs and symptoms were exhibiting on that supply tank?
A. There was massive amounts of frost on the supply tank. This was awhile back, but I seem to recall there was a lot of nitrogen vapor that was also coming out of the plumbing for the supply tank.
Q. Okay. And then did you see condensation on the exterior of the supply tank, as well?

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A. The image I have in the back of my mind was it was really mostly iced up more so than condensation. Obviously, at some point there was likely condensation, too, but it was really a large -- it was obvious.
Q. Was there water on the floor underneath the supply tank?
A. I think that there probably was. I don't -- we're talking decades ago. I don't specifically remember, but I can't imagine how there wouldn't be.
Q. Do you have a memory of how long it took for that failure to occur?
A. I have no idea. I remember us coming across it one day, and it was remarkable.
Q. And then there was a dewar, as well, at Duke that held liquid nitrogen that also lost vacuum seal?
A. That's correct.
Q. Did that exhibit signs and symptoms of vacuum seal loss?
A. In my opinion, it did. Basically, we were losing nitrogen at a rate that was significantly more than we were used to, and the outside of the tank was covered with frost.
Q. And was the floor underneath that dewar wet?
A. Again, I don't specifically -- that's not the image that stuck in my mind. I can't imagine how it

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would not have been. I just -- I should know, because I was the one who probably cleaned that up, so.
Q. Do you --
A. I suspect that there was moisture but, honestly, I have an image of the tank and the frost on the outside, and I don't have an image of what was happening on the floor.
Q. Where were you in your studies at the time that you saw the dewar lose its vacuum seal?
A. I would have been, I think this was in the beginning of my doctoral studies.
Q. What year would this have been approximately then?
A. It would have probably been, so I completed my Masters in '87, so it probably would have been in the late eighties.
Q. Okay. When you say you would have been the one to clean it up, why was that?
A. I was -- so I was in charge of the SEM. I basically from running the students through it to cleaning the column to making sure that there was -- my responsibility was to make sure there was nitrogen in the EDAX unit or the SEM.
Q. And so when there was this dewar failure, did you have anything to do with addressing it?

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A. Yes. You know, I went to my advisor and I told him we needed a new one, and that created a chain of events, and we eventually got a new one. We dealt with what we had to work with in the interim.
Q. When you were at Duke during this time, did they maintain a schedule of LN2 measurements of that dewar?
A. Measurements?
Q. Yes.
A. No. So it's -- the process is a little bit different in nature as to what happens at the clinic. Obviously, a little bit less critical, too. We're dealing with some instrumentation but not anything as critical as this.
Q. Okay. But just to be sure, the only thing the dewar did was hold liquid nitrogen, correct?
A. That's correct. My concern with nitrogen level was more on the supply tank.
Q. Sure. Okay. So you would agree if you have a vacuum seal loss on a cryogenic dewar you would expect to see ice formation on the outside, correct?
A. Correct.
Q. And you would expect to see water on the floor, as well, underneath it, correct?
A. I think that would also be a reasonable expectation.

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Q. And then between the ice and the water on the floor, would you expect the condensation on the outside of the tank?
A. Yes.
Q. And in your review of the testimony, have you seen any witnesses who say they saw either ice condensation or water on the floor associated with tank 4?
A. Not until the morning of the incident.
Q. And that's about 12:30 on March 4, correct?
A. That's correct.
Q. And that's in Dr. Conaghan's testimony; is that right?
A. That's correct.
Q. Your report was sent to us on November 6th. Have you done any further testing of your opinions since that time?
A. No.
Q. Have you done any testing of any kind since November 6?
A. The only --
MS. ZEMAN: Object. It goes beyond the scope of the expert discovery stipulation. Nothing done post service of this report would go to what he relied upon for it.

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MR. DUFFY: We've been going for almost an hour. Do you guys mind if we take a five-minute break?
THE WITNESS: That would be great.
THE VIDEOGRAPHER: We are going off the record at 11:09 a.m. Pacific standard time.
(Recess taken.)
THE VIDEOGRAPHER: We are now going back on the record, and the time is 11:22 a.m. Pacific standard time.
MR. DUFFY: Q. Dr. Kasbekar, are you familiar with finite element testing?
MS. ZEMAN: (Inaudible.)
THE WITNESS: Yes, Mr. Duffy, I am familiar with finite element analysis.
MR. ZEMAN: Q. How are you familiar with finite element testing?
A. I'm sorry. Did you say how?
Q. Yes.
A. So I got some exposure to it as a graduate student, but in my career part of the work that I did for the Department of Defense involved some pretty extensive finite element modeling.
[redacted]

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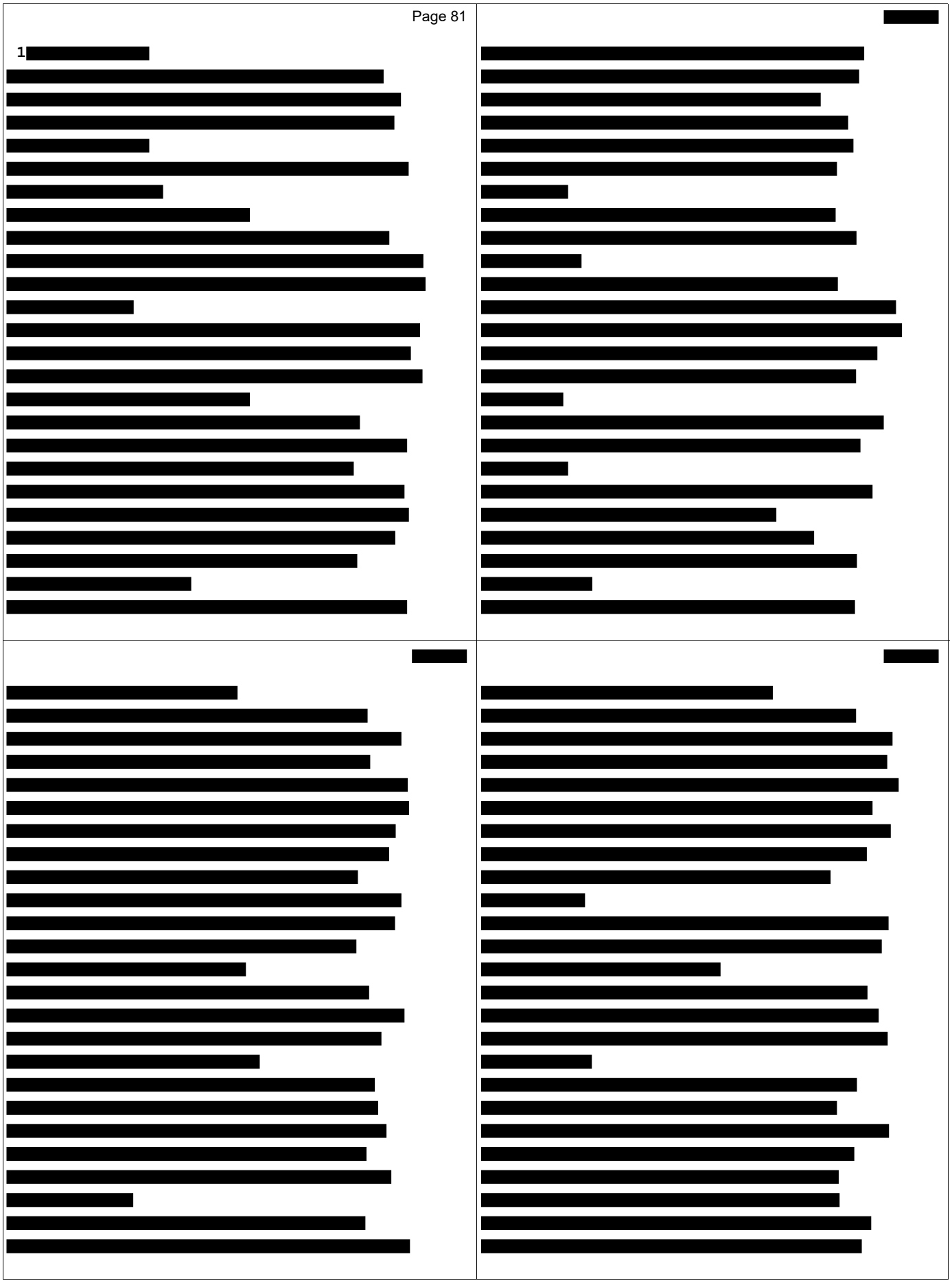

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first in your deposition here today you cannot give me an estimated stress level on the weld at issue; isn't that a fair statement?

MS. ZEMAN: Objection. Vague and ambiguous.

THE WITNESS: I am going to answer by saying that I am in the process of doing some work in response to things that came up in one of your expert's depositions, and whether or not this is a time to talk about draft work that I have done or not, I'm not sure. If I am told by counsel that I can, then I will.

MR. DUFFY: Q. Okay. Your counsel has already objected, and so I will let that objection stand. I will wait to see the coding (ph.) of your work.

To do finite element analyses, what tools would you need to do that?

A. Well, you need to basically model and mesh the portion of the structure that you are modeling. It requires certain software packages, and those software packages will bend based upon boundary conditions that are established. We will do calculations to provide stresses and strains.

Q. Do you have a license to any of the softwares that would allow you to run a finite element test yourself?

A. I own licenses to software that would allow me

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to do that. I no longer have current version licenses, and I also no longer have up-to-date licenses for all the modeling software.

Q. So at the time of your first report, did you have software available to you for which you had a license to conduct finite element testing on the estimated stress on the weld at issue?

A. I own a license, but again I didn't have licenses to all of the different parts of the software that were really needed to go from start to finish.

Q. So you couldn't have conducted the finite element testing?

MS. ZEMAN: Objection. Misstates testimony.

THE WITNESS: No, that's not true. I mean, I could always go out and buy or renew licenses. It's a financial matter more than anything else.

But again, it was a decision that I made based upon my understanding of thermal stresses in these materials at these temperatures and with this geometry that I thought that this was something that would have been fairly obvious to most, if not materials engineers certainly mechanical engineers.

MR. DUFFY: Q. So would it be fair to say before your first report you could have bought up-to-date software to conduct a finite analysis,

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correct?

A. Finite element analysis, I could have done that.

Q. And you did not, correct?

A. I did not.

Q. Now, before your second report you did not have a software license for a fine element testing that was up-to-date at that point, correct?

A. That's correct.

MS. ZEMAN: Misstates testimony.

MR. DUFFY: Q. So you would need to buy a license to have an up-to-date version of the finite element software, correct?

A. Well, as I say, I actually own two licenses, from the work I was doing for the army. But I have not kept them on maintenance recently, so I would have to incur an expense to do that, and I'd also have to resurrect a license for other parts of the software involved for the modeling and meshing process.

Q. And you didn't do that before writing the second report, correct?

A. I did not. Did not see a need.

Q. The finite element software that you have was from when you were doing work for the army; is that correct?

A. That's correct.

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Q. When did you stop doing that work for the army, what year?

A. I don't remember the exact year, but it was prior to 2016.

Q. Did you do any finite -- strike that.

Did you do any -- did you do any finite element testing on the double weld that you recommend to be done for the annular fill line?

A. I did not.

Q. Did you do any finite element testing on the exemplar weld at the annular fill line?

A. I did not.

Q. If you would just turn to your report, Dr. Kasbekar, at page 6. Let me know when you are there.

A. Okay. I'm on page 6.

Q. In the paragraph beginning October 28, 2020, do you see that?

A. I do.

Q. You were provided 29 pages of documents; is that right?

A. Correct.

Q. You reviewed those documents; is that right?

A. I did.

Q. And you came to the conclusion that it revealed

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knowledge of other failed and deformed tanks by Chart; is that right?
A. Correct.
Q. There were only two tanks involved in those 29 pages; is that correct?
A. That's correct.
Q. And there was no failure analysis performed on either one, correct?
A. Not to my knowledge based upon what I reviewed. I don't know whether Chart has done something beyond that.
Q. And one of the specialties that you hold is failure analysis, correct?
A. That's correct.
Q. And in the 29 pages of documents there was no evidence that weld cracks were reported; isn't that right?
A. Not that I could determine from those documents either way.
Q. And do you know if -- well, strike that.
Would you please turn to page 10 of your report, Dr. Kasbekar?
A. I'm on page 10.
Q. In the last sentence of the second paragraph it starts, "This location was directly above." Do you see

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that?
A. Yes.

.
A. Of any significance, at least.
Q. This is probably structural, but it is a little confusing to me when I read your report, and I was trying to figure out the figure numbering. It's okay. I just -- is there anything missing at all that --
A. No. So let me -- so I was as confused as you when I went to review my report in the PDF form, and the best I can tell is that some very carefully numbered figures in Microsoft Word, when it got written out as a PDF got juggled.
Q. Okay.
A. And it needs to be corrected. I apologize for it.
Q. I just wanted to make sure I wasn't missing something.

A. No, I actually put quite a bit of effort into checking that the figure I got for the captions, because when I read it last night in preparation for the depo I was like what has happened here. So I apologize for that.

It's something that needs to be corrected, because it makes the report difficult to read without doing some of your own investigation. So it's a technical issue between -- I think between Word and Adobe Acrobat.

[redacted]

[redacted]

[redacted]

[redacted]

Q. Did representatives of Pacific Fertility Center or representatives of their engineering experts at Exponent invite you to an inspection in March of 2018?

A. No.

Q. To your knowledge, based on everything you have reviewed in this case, was a representative of the patients in this case or Chart at the inspection at Exponent in March of 2018?

A. I don't know the answer to that.

Q. Have you seen any evidence that anybody other than the Exponent engineers were testing tank 4?

A. I haven't seen any evidence either way. I know that, to the best of my knowledge, I was not nor were my clients aware of that testing.

Q. You have done failure analysis for over 30 years, correct?

A. Over 35 years.

Q. You have worked with Exponent before?

A. Well, when you say with, they generally -- maybe with one or two exceptions on the opposite side of cases.

Q. You have had the opportunity to be in cases where Exponent was your opponent; is that fair?
A. I absolutely haven't. In fact, Exponent's founder is my advisor's advisor.
Q. Did you find it unusual that Exponent would conduct testing of tank 4 without inviting the patients of Chart?
A. I would not have done that. Given the level of experience that that firm has or should have, I would not have done it. I will leave it at that.
Q. Is it pretty extraordinary?
A. I wouldn't call it extraordinary. I have seen much, much worse from many other people, but it's not something that I would have done.

[redacted]

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[redacted]

[redacted]

[redacted]

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Again, I think it's a sophomore level engineering problem to at least realize that this is a significant loading factor that needs to be considered, and I did consider it. Can we beat it to death some more? Sure, we can beat it to death some more.

Mr. Duffy, when you get a chance, it doesn't need to be immediate, I might need to take a restroom break.

MR. DUFFY: Yeah, let's take a five minute break, if that's okay with everybody. Thank you.

THE VIDEOGRAPHER: We are now going off the record at 12:13 p.m. Pacific standard time.

(Recess taken.)

THE VIDEOGRAPHER: We are now going back on the record. The time is 12:24 p.m. Pacific standard time.

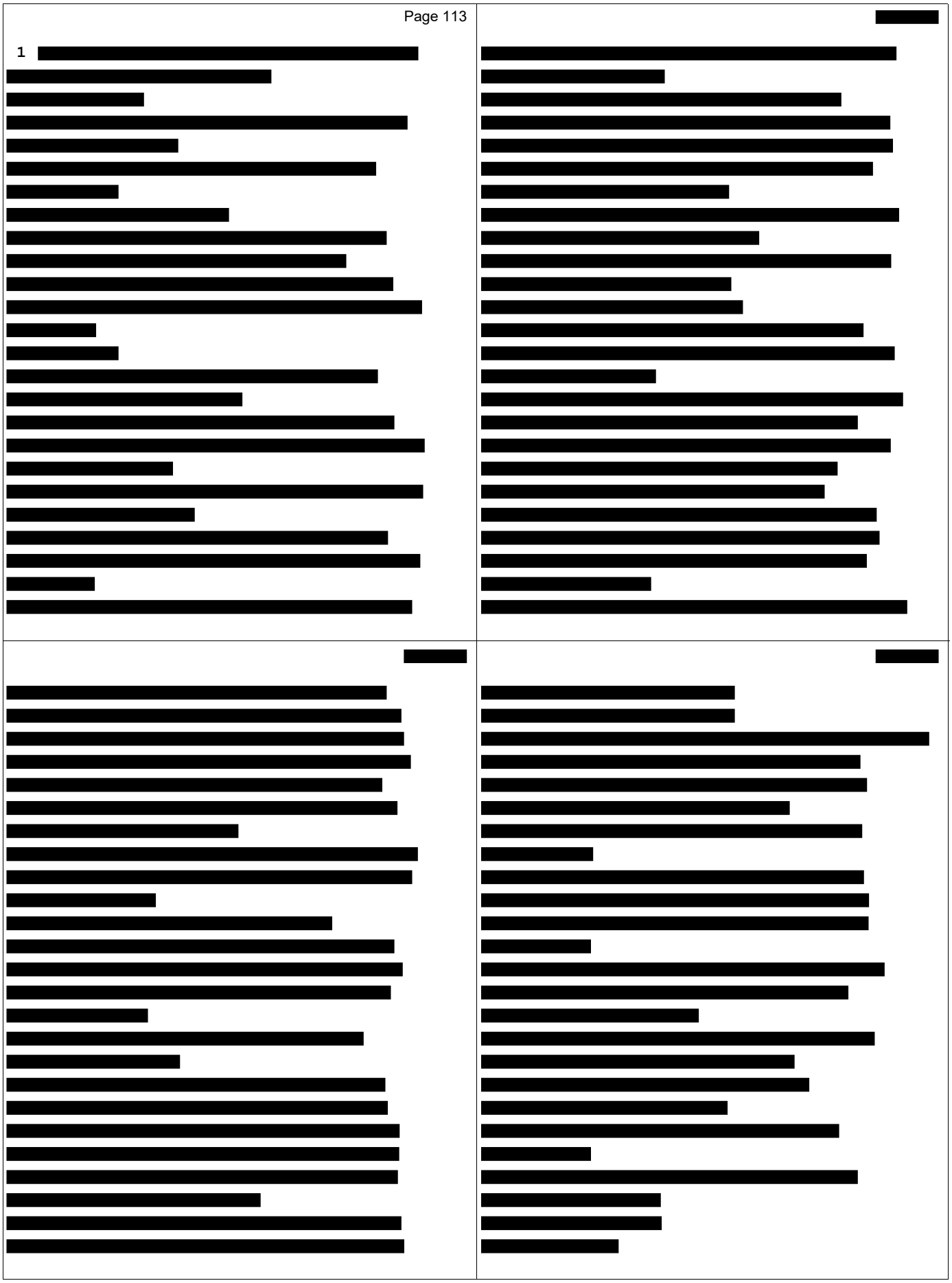
MR. DUFFY: Q. Okay. Dr. Kasbekar, would you turn to page 45 of your report?

A. Okay. I am looking at 45.

Q. In the middle of the page, because the page has one paragraph, do you see the sentence "ratchet marks are commonly seen"?

A. About how many lines down are you? I'm with you. Ratchet marks are commonly seen in fractures, yes.

[redacted]



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[redacted]

MR. DUFFY: Why don't we just take five more minutes and see if I can get organized and see if I have any other questions for you.

THE WITNESS: Okay. Mr. Duffy, not just for me but for my family, do you think we're close to a hour or

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so from being done?
MR. DUFFY: Yes, I do.
THE WITNESS: Okay. I'm just going to let them know that.
MR. DUFFY: All right. Thank you.
THE WITNESS: Thank you.
THE VIDEOGRAPHER: We are now going off the record at 12:49 p.m. Pacific standard time.
(Recess taken.)
THE VIDEOGRAPHER: We are now going back on the record, and the time is 12:59 p.m. Pacific standard time.
MR. DUFFY: Dr. Kasbekar, I looked at my notes and I don't have any further questions for you. Thank very much for your time.
THE WITNESS: Thank you, Mr. Duffy.
MS. ZEMAN: I do have a few questions.
EXAMINATION BY MS. ZEMAN
MS. ZEMAN: Q. Dr. Kasbekar, your testimony earlier referenced some degree of burn-through on your sample weld pieces. Could that burn-through be reduced or wholly avoided by refining the welding technique?
A. Yes, I believe so.
Q. Your testimony earlier referred to various materials that served as the basis for your opinions.

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Does Chart's DFMECA documentation also serve as a basis for your opinions?
A. It was part of the materials I considered. Yes, it does.
Q. Do you have any corrections you'd like to make to your report?
A. The figure caption something happened clearly between the version I proofed in Word and the version that was submitted in Adobe. I apologize to everybody who has had to read through those. So those need to be corrected. I don't know if it's every single one, but it's close to it. Something got scrambled.
Beyond that, the only two things I noticed is on page 5 of my report, which I'm trying to get to. I believe it's page 5. Yeah, under the image of the Sensaphone, that paragraph, the date on that for the controller inspection, which was October 13th, 2020, should have been, I believe, September 28th, 2020. I wasn't at that inspection. I just had that date wrong.
And then the other, I believe, is on page 40. And on page 40 it's the citation at the bottom that -- the first citation, Footnote 53, says 1-3 comma 97. I think that's a typo on my end. It should be 187 instead of 97.
And the only other thing I noticed, I think, and

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I agree with Mr. Parrington on this is I may have used the word stress riser instead of raiser. In our lab, anyway, we had conversations about that in particular, and it's usually raiser, but in conversation it's generally riser.
Q. On page 45, there is a reference to figure 62 and 63. I think this was discussed in your prior testimony. Should one of those references actually be to Figure 58?
A. You are on page 45?
Q. Correct.
A. And 62 through 63. I'm just reading it.
Q. It may have been the reference to Figure 2 in the sentence "additional ratchet marks are visible on several locations along the edge of the fractured surface."
A. So with regard to ratchet marks, Figure 58, Figure 60, Figure 61 I think are relevant.
With regard to secondary cracks, I may not get all of them, but certainly Figure 59 is one of them. There may be others.
Q. Anything else you wanted to comment on, or any corrections you wanted to make to your report?
A. I don't believe so. Secondary cracks, also, Figure 58 is relevant.

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Q. Okay. And in your roughly 37 years of failure analysis experience, how many times have you needed to attempt to recreate the exact failure to determine the cause of the failure to a reasonable degree of scientific certainty?
A. First of all, I'm not quite sure I'm at 37 years yet. It might be close. To answer your question, the majority of times you are unable to perfectly recreate the failure.
There are times where you can recreate portions of it, but especially when you have something where there is a field service history or if there is something being in use for several years, recreating it perfectly is not often something that happens.
MS. ZEMAN: And I'd like to enter one document as an exhibit. I will drop that into the chat feature. Just a second.
This should be entered as Plaintiffs' Exhibit 409.
(PLAINTIFFS' EXHIBIT 409 WAS MARKED FOR IDENTIFICATION.)
THE VIDEOGRAPHER: I'm assuming you'd like me to stamp that, Amy?
MS. ZEMAN: Please.
Q. Once you have that, if you could open that up.

A. Okay. I'm looking at it.

[redacted]

[redacted]

[redacted]

[redacted]

MR. DUFFY: That's all I have. Thank you.
THE WITNESS: Thank you, sir.
MS. ZEMAN: No further questions.
THE WITNESS: Thank you.

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THE VIDEOGRAPHER: This marks the end to the remote deposition. We are going off the record at 1:10 p.m. Pacific standard time. Thank you, Counsel.

MS. ZEMAN: Thank you all. Thank you, Anand.

(Deposition concluded at 1:10 p.m.)

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I have read the foregoing deposition transcript and by signing hereafter, subject to any changes I have made, approve same.

Dated_____.

_____
(Signature of Deponent)

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DEPOSITION OFFICER'S CERTIFICATE

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN FRANCISCO)

I, Wendy L. Graves, hereby certify:

I am a duly qualified Certified Shorthand Reporter in the State of California, holder of Certificate Number CSR 6138 issued by the Certified Court Reporters' Board of California and which is in full force and effect. (Fed. R. Civ. P. 28(a)(1)).

I am authorized to administer oaths or affirmations pursuant to California Code of Civil Procedure, Section 2093(b) and prior to being examined, the witness was first duly sworn by me. (Fed. R. Civ. P. 28(a)(a)).

I am not a relative or employee or attorney or counsel of any of the parties, nor am I a relative or employee of such attorney or counsel, nor am I financially interested in this action. (Fed. R. Civ. P. 28).

I am the deposition officer that stenographically recorded the testimony in the foregoing deposition and the foregoing transcript is a true record

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of the testimony given by the witness. (Fed. R. Civ. P. 30(f)(1)).

Before completion of the deposition, review of the transcript [xx] was [ ] was not requested. If requested, any changes made by the deponent (and provided to the reporter) during the period allowed, are appended hereto. (Fed. R. Civ. P. 30(e)).

Dated: December 1, 2020

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